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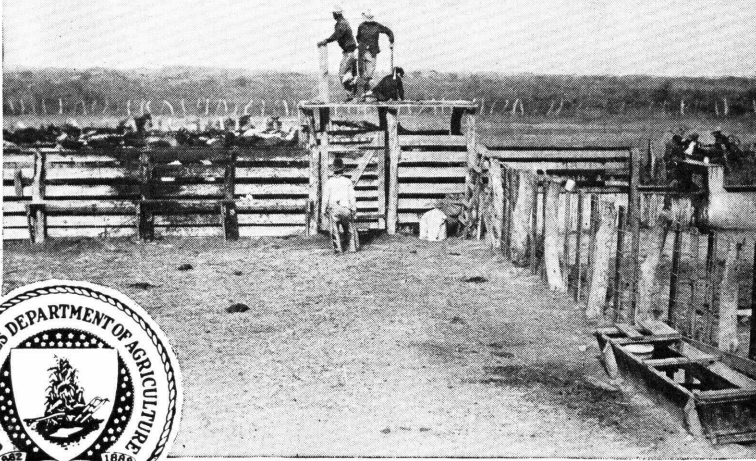
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May 1940

FEED-LOT AND RANCH EQUIPMENT *for* BEEF CATTLE



PRACTICAL EQUIPMENT which is more or less essential in the successful handling of beef cattle on the range and in the feed lot is discussed in this bulletin and illustrated by drawings and photographs.

Details concerning silos, barns, and concrete work which have previously been presented in other publications are not included, but reference is made to the publication containing such details.

Many of the State agricultural colleges have working drawings for feed-lot and ranch equipment. The extension agricultural engineer at the college or county agricultural agents can usually advise how such plans may be obtained.

Washington, D. C.

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FEED-LOT AND RANCH EQUIPMENT FOR BEEF CATTLE

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CONTENTS

	Page		Page
Sheds.....	1	Scales and scale pens.....	10
Windbreaks.....	3	Dehorning and branding chutes.....	11
Self-feeders, feed troughs, and hayracks.....	4	Corrals.....	13
Watering tanks and troughs.....	6	Dipping vats.....	17
Feeding floors.....	8	Cattle guards.....	17
Silos.....	8	Cattle stocks.....	18

SHEDS²

IN THE handling of beef herds primarily for the production of feeder cattle and in the fattening of cattle for market, shelter should be provided that will give protection during severe cold and stormy weather. Beef cattle will withstand extremely cold weather if kept dry. Cattle having access to bedding, both under cover and in the open, frequently show a preference for the latter. Especially is this true during weather which is extremely cold but dry and still.

Sheds with southern exposure provide satisfactory shelter for beef cattle in most instances. Figure 1 shows plans for a shed which is inexpensive and will serve the purpose very satisfactorily in any area, excepting where extremely low temperatures are reached. In the range country, especially in the colder regions, sheds similar to the one illustrated in figure 2 are provided on improved stock farms producing purebred beef cattle for breeding purposes.

In addition to sheds about the headquarters, some ranchmen have constructed open sheds in pastures. A simple type of shed is shown in figure 3. The construction of bays 7 feet long is very desirable for this type of shed. The number of bays so constructed, of course, depends on the length desired or number of cattle to be sheltered. If such a shed is built in a pasture it is not necessary that corrals or other fencing be used in connection with it. Cattle will seek the shelter when they need it. The ends and back of the shed should be closed. Sharp corners under the shed should be eliminated by rounding the corners or slatting across them at a 45° angle. The roofing of this type of shed may be of sheet metal or sheathing covered with good-quality prepared roofing. It is usually advisable to set posts in concrete, though good cedar and other suitable wood will last for many years if set in the ground. Almost any timber of sufficient strength, if properly treated with preservative, will serve.³

¹ This is a revision of former editions by W. H. Black and V. V. Parr. Acknowledgment is made to the Bureau of Agricultural Engineering for cooperation in supplying a large number of the drawings for this publication.

² U. S. Department of Agriculture Farmers' Bulletin 1350, Beef-Cattle Barns, illustrates and discusses a number of types of desirable barns for various classes of beef cattle.

³ Farmers' Bulletin No. 744, Preservative Treatment of Farm Timber, contains information on this subject.

Sheds of this type are usually economical when their many uses are considered. In the more southerly areas they are sufficient for fattening cattle.

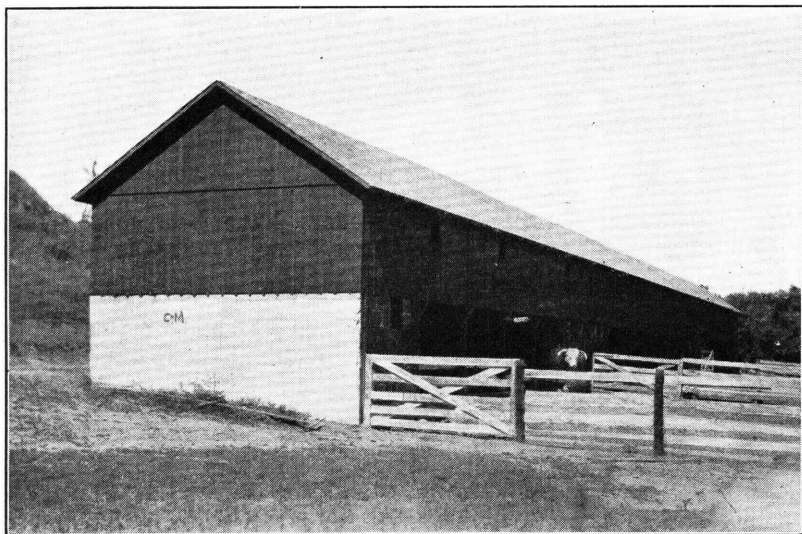


FIGURE 2.—A popular type of shed in the colder regions. Provision is made for storage of hay or other roughage in the upper part.

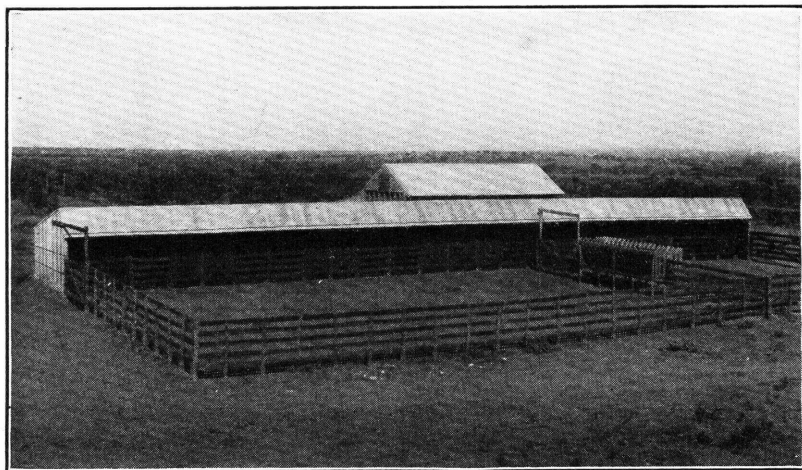


FIGURE 3.—A desirable type of shed for use in the range area of the Southwest.

WINDBREAKS

On ranches that produce cattle for meat purposes in relatively large numbers, especially in the colder climates, windbreaks are constructed to afford protection from disagreeable winds. They are especially desirable in pastures that are used for winter grazing, where little or no natural protection is afforded. A suitable windbreak may be

built in the form of a board wall 8 feet high. A lower wall will furnish less protection. The framework may be of 6-inch posts set 3 feet in the ground and 2- by 4-inch scantlings nailed horizontally. The posts should be about 7 feet apart and 2- by 4-inch scantlings 14 feet long should be used. The remainder of the material may be 1 by 12 inches by 8 feet, set perpendicularly. The wall may be as long as desired. It is very important that the construction be strong enough to prevent blowing down. The windbreak should be placed at right angles to the prevailing winds.

SELF-FEEDERS, FEED TROUGHS, AND HAYRACKS

Most cattle are hand-fed. Self-feeders have been used chiefly with young growing stock, and the use of self-feeders is increasing

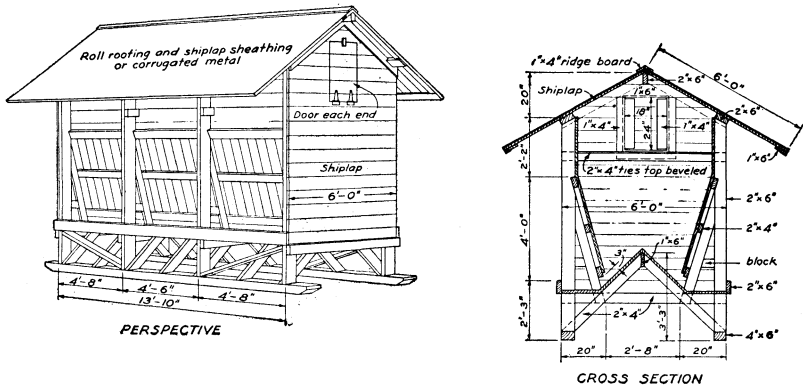


FIGURE 4.—A portable self-feeder.

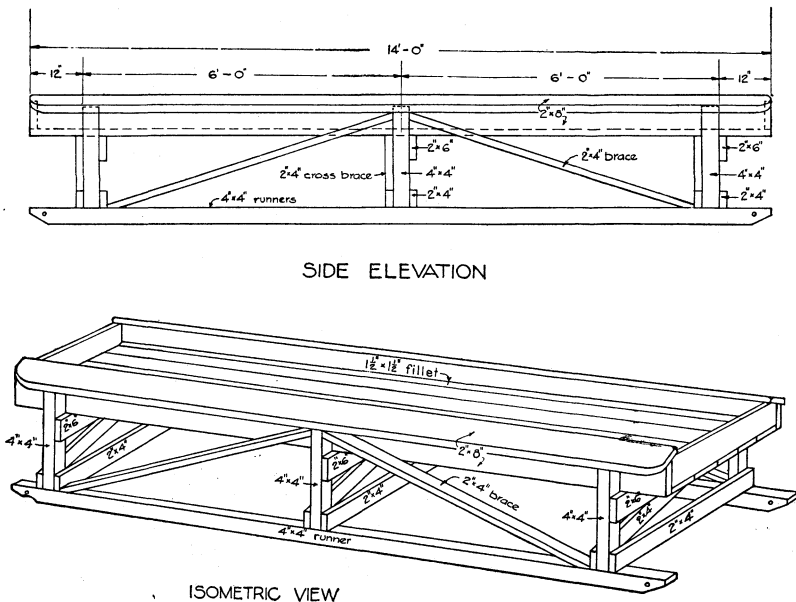


FIGURE 5.—A well-constructed, portable feed trough.

somewhat in the fattening of cattle for market. Such equipment should be used with care, however, since the early part of the feeding period is perhaps the most critical time in the fattening process. It is very essential that fattening feeds be given gradually, and this can be controlled to better advantage if the animal is fed two or three times a day rather than by allowing it access to an unlimited supply of feed in a self-feeder. After the cattle are on full feed very little difficulty should be experienced with the self-feeder. Plans for a self-feeder are shown in figure 4.

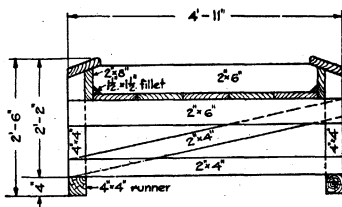


FIGURE 6.—Sectional view of feed trough.

A portable feed trough is shown in figures 5 and 6. This trough has several desirable features. It is strong, being well-braced, has no sharp corners, and is constructed so as to prevent cattle from throwing feed through the trough. Troughs mounted on skids are easily moved from place to place. Many cattle feeders use such a trough in the dry lot during the winter and on pasture during the grazing season. Stationary troughs should be placed in a well-

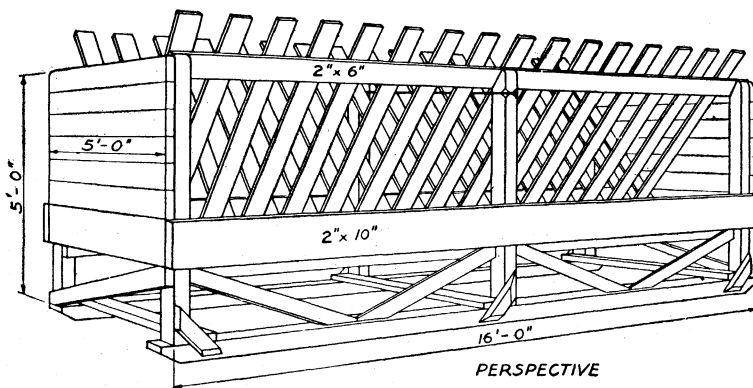


FIGURE 7.—Desirable type of rack for dry roughage.

drained place and preferably on pavement. The pavement should extend out several feet each way from the trough, permitting the cattle to have ample space to stand on while eating from the trough.

Most cattle feeders feed hay or other dry roughage under cover. However, when the simpler types of sheds are used, and only for shelter, hayracks in the open are resorted to. As in the case of the feed troughs, there is an advantage in using a portable rack. Figures 7 and 8 show a rack that should meet the needs of most cattle feeders.

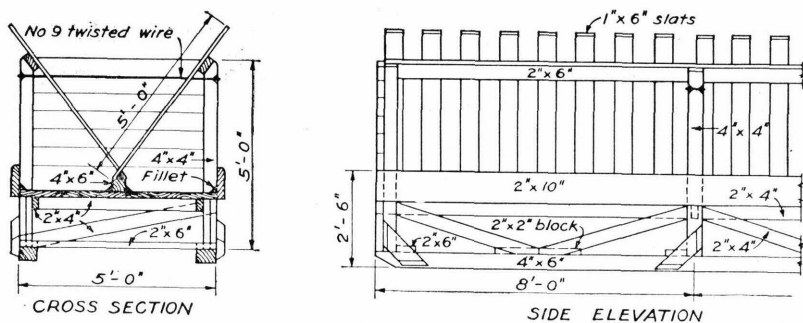


FIGURE 8.—Sectional view of hayrack.

WATERING TANKS AND TROUGHS

Concrete tanks are used almost exclusively for storage of water for feed-lot use. Wells are depended on in most instances for the supply, and windmills or gas engines furnish the power for filling the tanks and troughs with water. Concrete tanks⁴ are usually made round or rectangular (fig. 9). Round tanks are desirable when a large quantity of water is to be stored, as less material for construction is required for a given capacity than for the rectangular or square types. Rectangular tanks and troughs permit greater numbers of stock to drink at one time than square ones of like capacity. Round tanks may be reinforced more satisfactorily than other types, but the forms are more difficult to build.

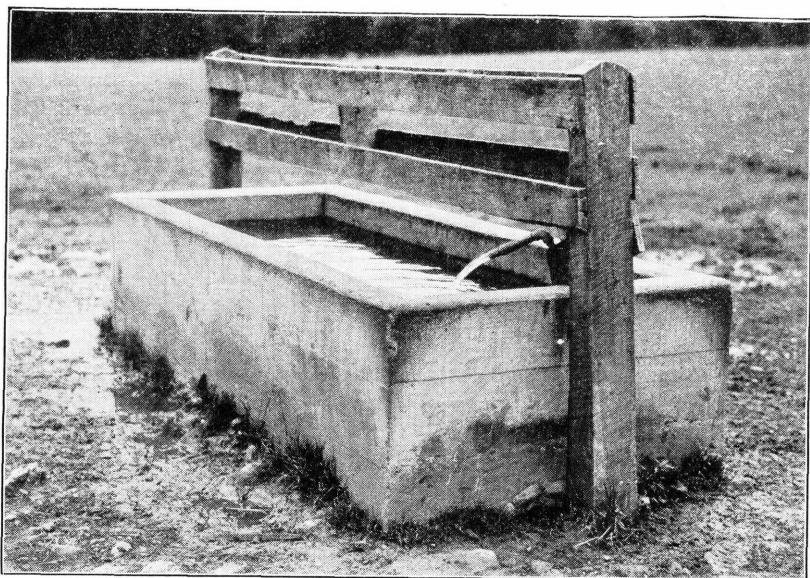


FIGURE 9.—Rectangular watering trough. Note the provision for keeping livestock out of tank.

⁴ Farmers' Bulletin 1772. Use of Concrete on the Farm gives details of the construction of concrete watering troughs, tanks, and dipping vats.

On the ranges wells, springs, streams, and dirt tanks or reservoirs constructed to catch the rainfall are the usual sources of the water supply.⁵ Various combinations of the above units of supply often occur within a relatively small ranching area or on a single ranch. A ranchman has little choice in determining his water supply, as the source available is the influential factor. On many ranches dirt tanks, which have caught the rainfall, supply most of the water. In some instances the tanks are surrounded by fences and the water is piped through the tank to a watering trough. Float valves are used to control the flow of water in such instances.

When wells are used as a source of supply, windmills are the most commonly used power unit. In some instances gas engines are installed in addition to windmills. The water is pumped directly into the trough. In other instances, particularly in the semiarid areas in the Southwest, a common arrangement is to have the water pumped

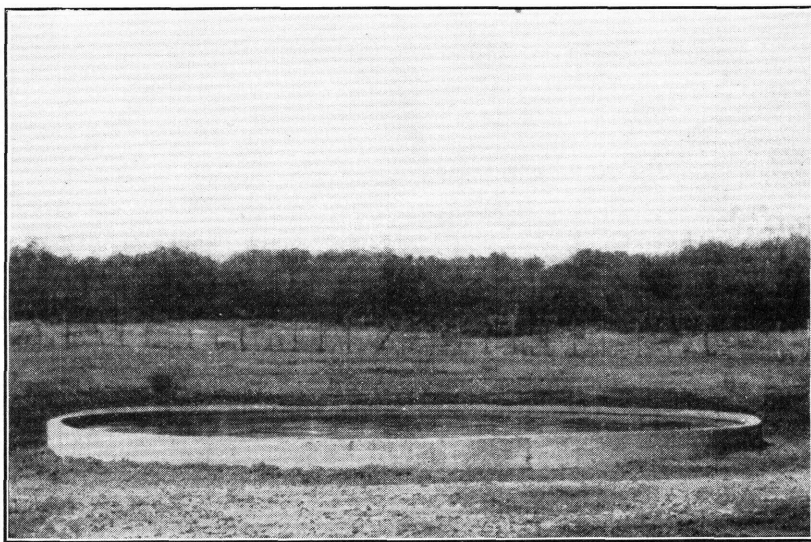


FIGURE 10.—Round watering trough, the type used extensively in the Southwest.

into steel tanks, or dirt or impervious reservoirs, and piped to troughs. Containers of these kinds are constructed in various sizes, usually ranging from 20 to 100 feet in diameter and from 4 to 8 feet deep.

It is advisable to have an abundant supply of fresh water available at all times. Fattening cattle will consume from 5 to 10 gallons of water a day. For 2-year-old steers provision should be made to have at least 10 gallons available per head per day. Cattle will not consume a sufficient quantity of water during the winter if compelled to drink water that is ice cold. Some suitable heating device should be installed in cold climates to keep the water above the freezing point. There are a number of satisfactory tank heaters on the market.

Figure 10 shows a very satisfactory type of watering trough used extensively in the Southwest. The filling of the trough is usually controlled by a float valve connected with a pipe from a reservoir,

⁵ A complete discussion of the water supply for range conditions appears in Farmers' Bulletin 1395, Beef-Cattle Production in the Range Area.

which is usually supplied with water pumped from a well by a windmill. This type of trough is generally not over 20 inches in depth, often with a diameter of as much as 40 feet, depending primarily on the number of stock to be watered. The approach surrounding the trough should be a gradual rise starting from about 20 feet away and contacting the trough about 10 inches below the top. When installation is made in this manner, very little difficulty is experienced with cattle getting into the tank. The animals are reluctant to step into the water when the bottom of the tank is considerably lower than the ground outside.

FEEDING FLOORS⁶

In dry-lot feeding, particularly in the winter and spring months, it is important to have the troughs or bunks on a hard surface, preferably pavement. When the feed lot is equipped in this manner, cattle are kept cleaner, have more comfortable footing, enabling them to

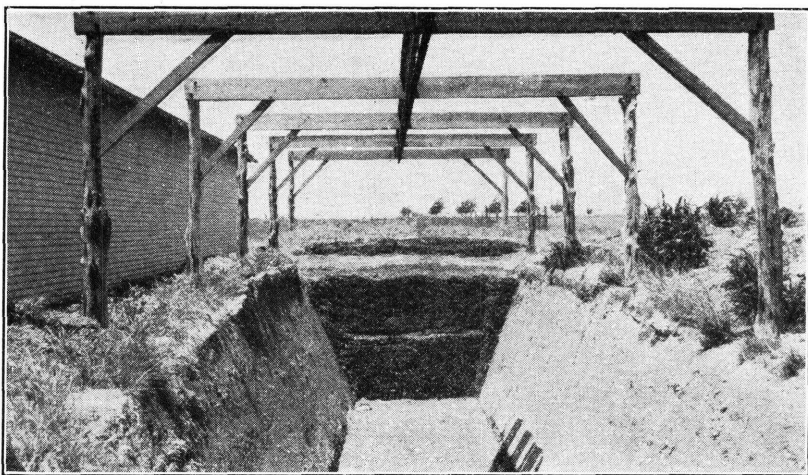


FIGURE 11.—A well-constructed trench silo from which part of the silage has been removed. Note the desirable slope and good condition of the side walls.

feed to better advantage, and the actual feeding can be done with greater ease. In addition to this, there results a large saving of feed for hogs following the cattle. When grain is fed in the ration rather heavily, it is very advisable to have hogs follow the cattle. It is not uncommon in many years to find that any profit resulting from the cattle feeding may be attributed to the hogs which are handled in connection with the cattle.

SILOS

Silos are an important part of feed-lot equipment in many beef-cattle production areas. Silage is particularly valuable for wintering beef cattle and for the fattening of cattle for market in areas where there are limited quantities of legume hays. There are three types of silos, the above-ground, the pit,⁷ and the trench. In most

⁶ A complete discussion of the construction of feeding floors appears in Farmers' Bulletin 1772. (See footnote 4.)

⁷ Farmers' Bulletin 1820, Silo Types and Construction, gives details of this type of silo.

sections of the Corn Belt above-ground silos are used exclusively. In the semiarid regions of the Southwest pit and trench silos are more common. In firm, clay soils, where there is no seepage, the trench silo and the pit silo are quite satisfactory (fig. 11).

The construction of the trench silo is less difficult than is the case with other types. Practically all the work can be done with ordinary farm labor. Most of the excavating can be accomplished with horses, plows, and a scraper such as a fresno. The sides of the trench usually need to be smoothed up somewhat with a spade. The size of the trench is governed by the quantity of silage to be fed daily and the length of the feeding season. However, trench silos are seldom made over 10 feet in depth and 14 feet across the top. The sides should have some slope. Three inches per foot of depth should be satisfac-

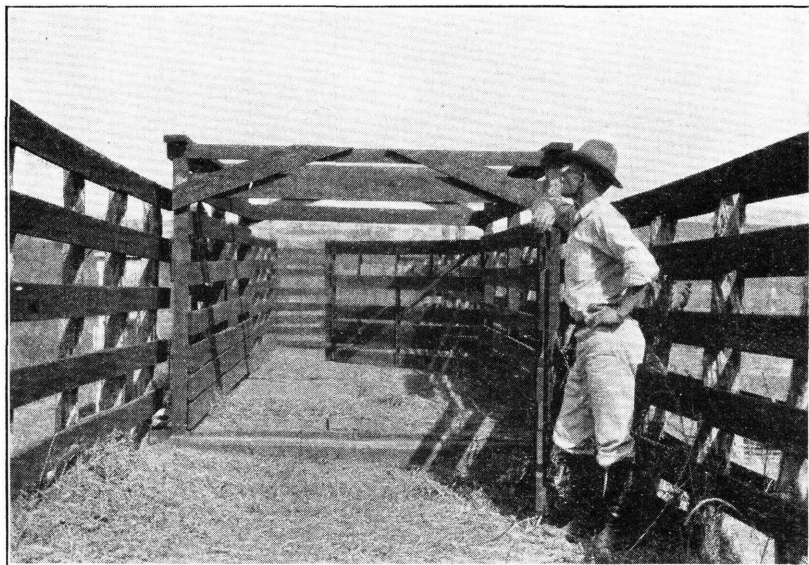


FIGURE 12.—Livestock scales suitable for weighing beef cattle. Note that the scale pen is constructed on the scale platform.

tory in the most suitable soils. Approximately 50 percent more space is required in the trench silo for the storage of a given amount of silage than in other types, as the silage will not settle so compactly in the trench. In feeding from the trench silo, a slice is taken off from top to bottom. The trench silo should be located on comparatively high ground, so that surface water will drain away. In filling the trench it is well to let the silage come considerably above the surface of the ground, and top off as one would round the top of a haystack. This will make it possible to have a full trench of silage after settling. The silage should be covered, preferably with some kind of cheap roughage that has been moistened. In some areas where straw or other roughage is scarce, a layer of soil about 1 foot in depth is used for a covering, with satisfactory results.

SCALES AND SCALE PENS

Scales are a valuable piece of feed-lot equipment, as it is important in cattle feeding to know the weights of the cattle from time to time. Some of the most successful cattle feeders weigh the cattle every month. The scales should be installed close to the feed lot or corrals. The scale pen should rest on the platform of the scales. Accurate weights cannot well be obtained otherwise with groups of cattle, as

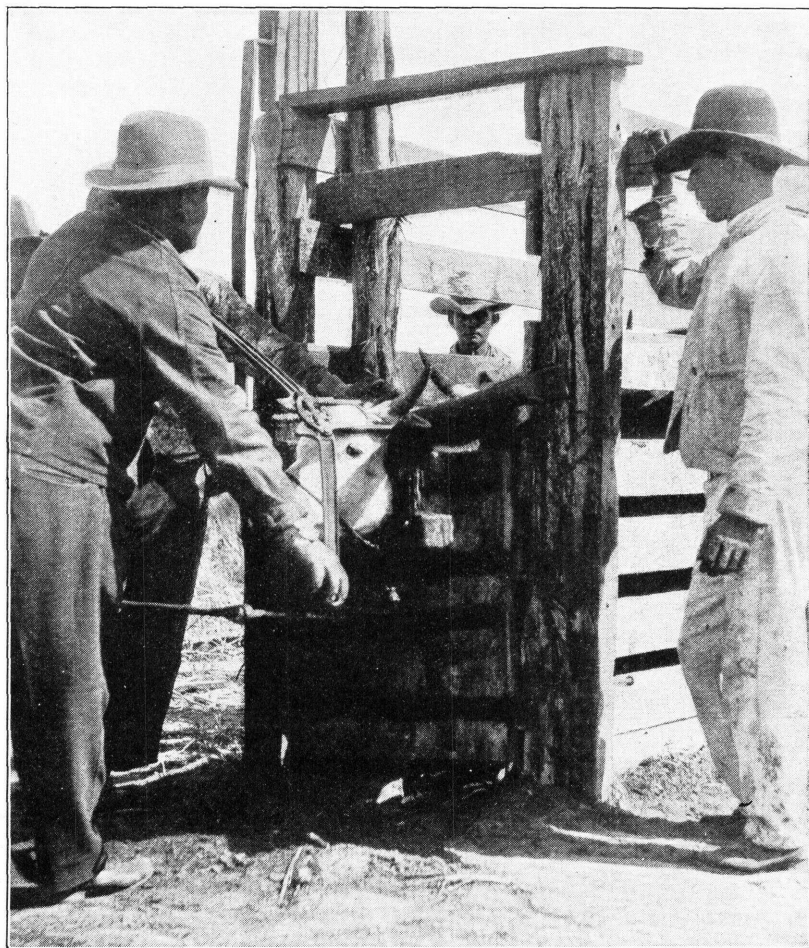


FIGURE 13.—Typical dehorning chute with stationary sides.

cattle will crowd against the sides of the pens and this will influence the weight. An end view of a very satisfactory scale pen is shown in figure 12.

With the increase in the system of buying feeder cattle directly from producers, scales are coming into wider use in the range country. Many feeders prefer to buy cattle by weight rather than by the head. At some shipping points railroad companies have installed scales, and others have been built jointly by a number of cattlemen.

DEHORNING AND BRANDING CHUTES⁸

A chute for holding cattle is an important piece of equipment. It may be used for dehorning, castrating, or branding, and for administering other treatments (figs. 13 and 14).

In making a chute for holding cattle it is especially desirable in localities where branding is done to have one side movable so that the animals can be held snugly under pressure without being injured against the side of the chute. A branding chute so constructed is known as a cattle "squeeze." This type, aside from being useful in connection with branding, also has an advantage over the ordinary chute in castrating and vaccinating, as the animal can be held more



FIGURE 14.—Side view of branding chute, which is suitable also for vaccinating and for treating wounds. Note bars which permit easy access to animals.

firmly. Figures 13 and 14 are typical of the more common types of chutes with the stationary sides. Plans for a desirable type of squeeze are shown in figure 15.

In dehorning cattle it is essential to have the front of the chute so constructed that the head of the animal may be held absolutely firm. There are many methods of holding the head firm but the one shown in figure 15 is in common use in the range area. A lever forces the animal's head down as the nose is placed in the padded hole in the shelf which is attached to the front of the gate. The same gate is used to stop the animal when being branded. On many ranches both operations are performed at the same time and the animal is examined for the presence of screwworms or other external parasites.

⁸ Farmers' Bulletin 1600, Dehorning, Castrating, Branding, and Marking Beef Cattle, gives a complete discussion of the subject.

In constructing branding chutes in connection with a set of corrals, it is advisable to arrange the chute so that branding fires may be built outside the corrals, also that the side of the animals to carry the brand will be toward the fires. In the set of corrals shown in figure 16, the chute is arranged for branding on either side of the animal.

CORRALS

Nothing in the way of equipment or improvement adds more to the ease of handling cattle than a convenient system of well-constructed

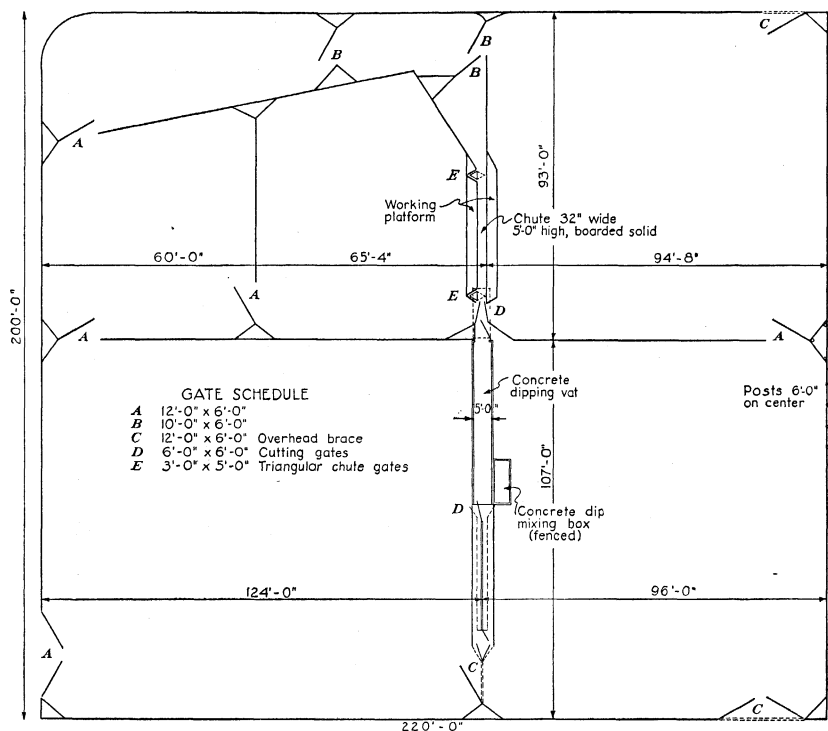


FIGURE 16.—A convenient corral system, showing arrangement of cattle-marking chute and dipping vat.

corrals. Two satisfactory systems are shown in figures 16 and 17. It is not presumed that each operator will have need for the same size system of corrals nor will each individual's ideas of lay-out conform to a single plan. Certain salient features in planning a system of corrals should be observed, however.

Corrals should be conveniently located with respect to getting cattle into them. It is well to avoid long drives, if possible. Many ranchmen build corrals easily accessible from several pastures. In addition, small pastures, or "traps," are commonly found in connection with the system of corrals. Watering places in close proximity to or within the corrals are desirable. A trap may enclose a watering place. Getting cattle into the corral can be facilitated by constructing a wing leading out from a corner.

Especially on large ranches where many horses are to be handled, the arrangement shown in figure 17, which includes a large round

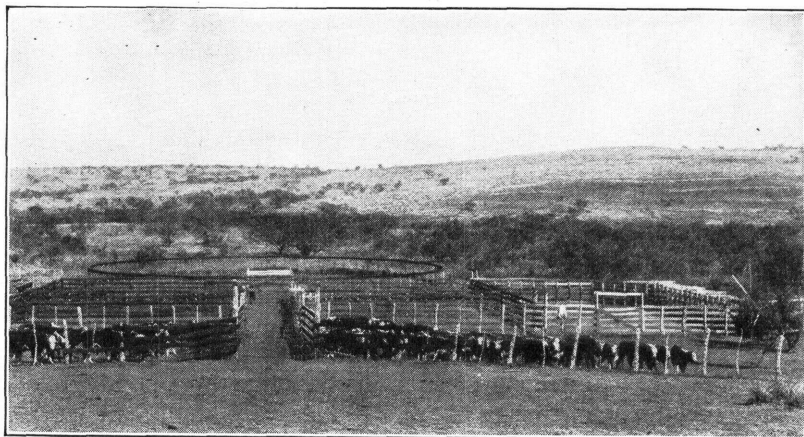


FIGURE 17.—A desirable corral system including a large round pen, especially suitable for handling horses. The central alley is equipped with gates for sorting the animals and diverting them into the various pens.

enclosure, is popular. Round pens reduce the number of accidents to livestock and facilitate roping. Besides, they are economical to build in proportion to the area enclosed.

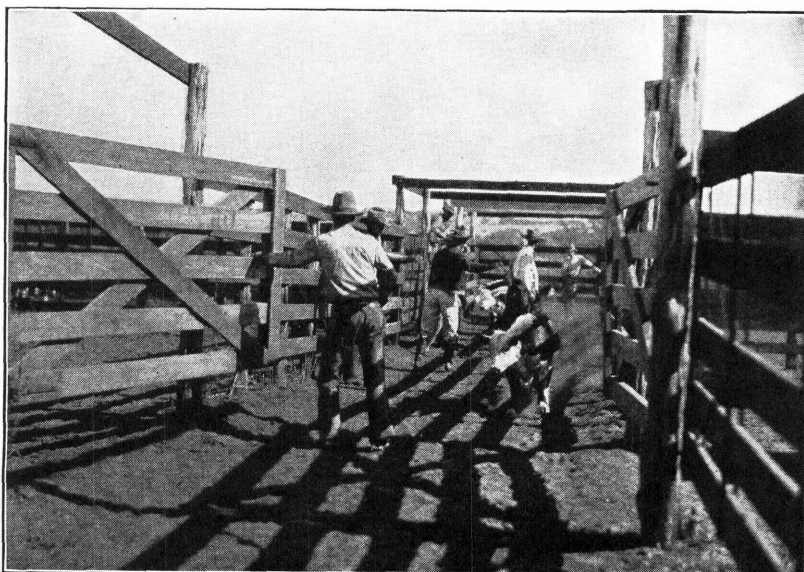


FIGURE 18.—Sorting cattle in an alley equipped with gates that are operated by men on the ground. This method is widely used on beef-cattle ranches.

Even though the number of cattle to be handled is small, it is advisable to construct a system of corrals of two or more pens to permit "cutting" or the separation of classes of cattle when desired. In a

large system, a cutting alley is a convenient arrangement. Men working in an alley built like that shown in figure 18 can handle cattle easily and effectively. This system is used at all public stockyards.

Very conveniently arranged cutting chutes are found on some ranches. The ground plan of an efficient arrangement of a chute gate and cutting gates is shown in figure 16. At each end of the working platform along the cattle chute shown in the diagram is a triangular stop gate which swings so as to allow or prevent further progress of cattle as they are handled in the chute. The cutting gates are operated from an overhead platform, while the chute gates are operated from the working platform (fig. 19). Each gate is fitted with a handle. Stop gates may be operated from an overhead platform or a side

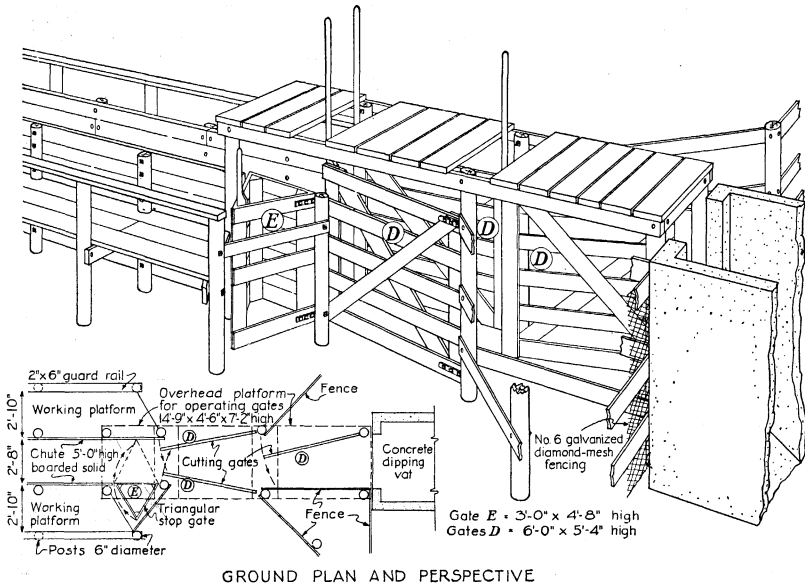


FIGURE 19.—Ground plan and perspective of a cutting chute with overhead and working (side) platforms, triangular stop gate, and cutting gates.

platform on the ground. After being allowed to pass the stop gate, an animal may be cut to the right, left, or straight ahead by proper manipulation of cutting gates (fig. 19). Gates of this kind should be well constructed, and they must be hung in such a manner as to operate easily.

In constructing corrals such units as cutting, branding, and de-horning chutes and dipping vats may be built into the system. Complicated systems of chutes or other construction should be avoided.

The extensive use at present of motor trucks makes it advisable to construct docks for loading and unloading livestock. Trucks are being used to advantage in the transportation of such classes of livestock as calves and young bulls in the range area. Such a loading dock is usually connected with the corrals. The construction is

simple and the dimensions required may be determined from the height and width of the truck body being used. Probably the greatest precaution to be exercised is to allow sufficient slope to the platform approach. Cleats nailed across the approach will lessen the probability of an animal's falling.

DIPPING VATS⁹

Where it is necessary to dip large numbers of cattle, as is the case in many sections of the range country, it is advisable to have the type of vat shown in figure 20.

CATTLE GUARDS

In many sections of the range country highways are not confined to section lines, as is common in the Corn Belt, but run through ranches

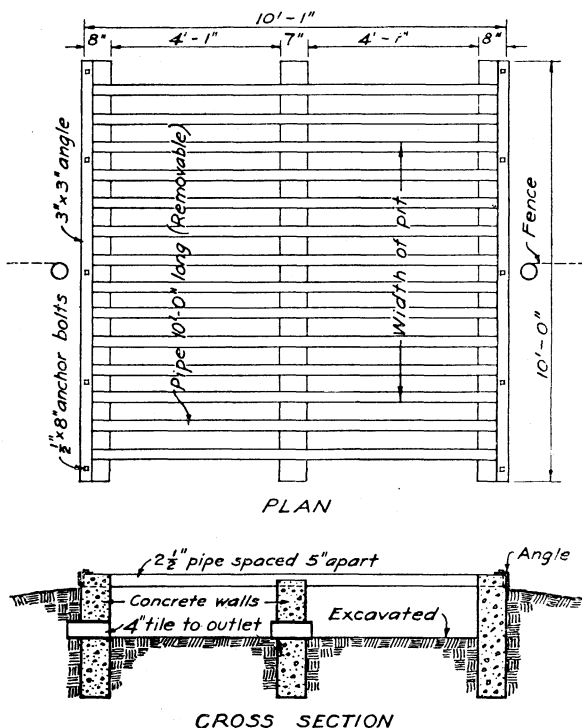


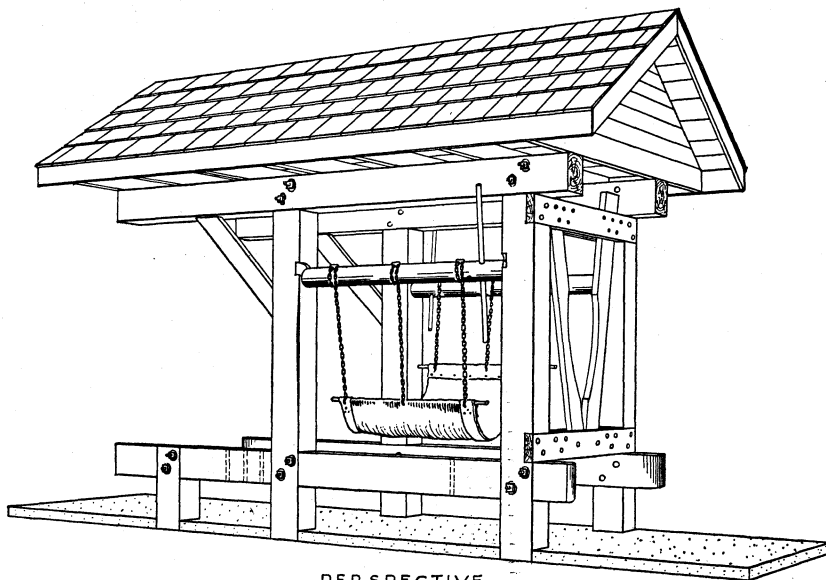
FIGURE 21.—Plan and cross section of cattle guard.

diagonally or otherwise. In instances of this kind, cattle guards are used between ranches or certain pastures of the same ranch. The guards are constructed so that automobiles can pass over them, but prevent cattle from crossing. The installation of cattle guards saves much time under these circumstances. A satisfactory type of cattle guard is shown in figure 21.

⁹ See footnote 4.

CATTLE STOCKS

Cattle stocks are important equipment on farms and ranches where valuable breeding stock is handled. The use of such equipment in



PERSPECTIVE

FIGURE 22.—Cattle stocks used in handling exhibition animals or valuable breeding stock where it is necessary to get the animal off its feet. The roof reduces deterioration from rain and sun.

trimming hoofs and horns, vaccinating, or treating cattle reduces the liability of injury to a minimum. Moreover, fewer laborers are required for the operations mentioned when this equipment is used.

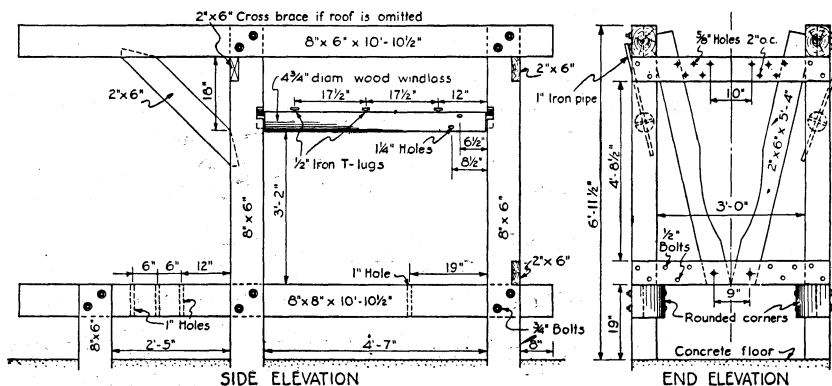


FIGURE 23.—Details of the construction of the cattle stocks shown in figure 22.

Figures 22 and 23 show a desirable type of cattle stocks and a perspective with dimensions, respectively.